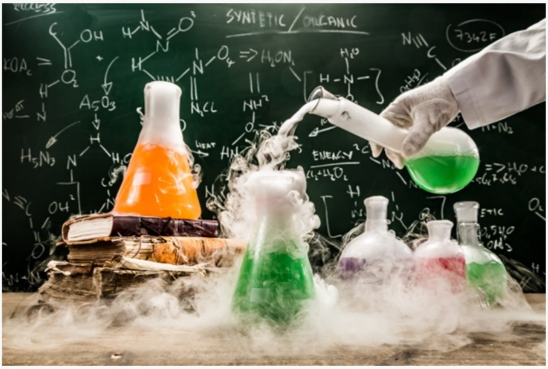
Collapse all

Physical Science, Part 1

ATTENTION

Grading at the end of the semester can take 7 school days!
Submit your **last assignment two weeks** before your school's semester ends.



How to Take This Course

Complete all the quizzes and the assignment in each unit. Once the quizzes for a unit are complete, you will have access to the unit test. We recommend you complete the unit assignment before you attempt the unit test; the assignment will help you prepare. You will have access to the final after you have been enrolled in the course for at least 30 days, all unit tests are completed, and your assignments are graded.

Allow 3-4 school days for an assignment to be graded. To understand the course grading, read the full course instructions.

Course Instructions

How This Course Works & Suggested Timeline

List of Lab Supplies and Equipment

This is a laboratory science course; all assignments are mandatory. Each unit will have a lab investigation. You need to complete each lab as directed and submit your lab write-up.

You do NOT have to purchase a lab kit. Here is a **list of supplies and equipment** that you will need for the course. Note that some labs have a 'Virtual Lab Assistant' option for students who cannot get the required materials.

Submitting Your Assignments

Ask The Teacher

Meet your teacher for this course and ask a question.

Need help with the course? We offer online tutoring; find more details about it here.

MANDATORY QUIZ

Completion

You are required to take this quiz before you start the course. To prepare, read the course instructions and the "submitting your assignments" document, watch the video on the how this course works page and review the suggested timeline.

Learning Objectives & Standards Met By This Course

Unit 1: Matter

In this unit, students will learn the fundamentals of properties of matter in order to predict properties based on the Periodic Table. After reviewing how chemistry and physics relate to our world, students will look at the scientific process and how to write a claim evidence reasoning CER paragraph. Students will then learn how to classify matter as a pure substance (element or compound) or a mixture (homogeneous or heterogeneous). They will then explore the chemical (flammability, toxicity, reactivity, etc) and physical properties (boiling point, melting point, electrical conductivity, magnetism, and density). Finally, they will learn how Kinetic Energy impacts the states of matter of a substance. Skills include writing conclusions with CER, filtration techniques to separate matter, and designing lab procedures including identifying variables and potential sources of error.

At the end of this unit, students will be able to

- Classify matter as a mixture or pure substance.
- Be able to determine if a change is physical or chemical.
- Distinguish between a physical and chemical property when describing matter.
- Make observations in order to determine the properties of matter.
- Classify matter as solid, liquid, or gas.
- Solve gas law equations for a missing variable.

Unit 1 Study Guide

This study guide will help you preview the concepts and guide your learning as each new skill or concept is introduced. Use this study guide as the foundation of your notes. You may use it on the unit quizzes, unit tests, and course final.

Click on the link above and make a copy of the file; you can open the document in Google Docs. If you prefer to print it, it is available as a PDF.

1.1 Our World

Quiz 1.1 Completion

1.2 Scientific Method and CER

Quiz 1.2 Completion

1.3 What is Matter?

Quiz 1.3 Completion

1.4 Physical and Chemical Properties

Quiz 1.4 Completion

1.5 Classifying Matter

Quiz 1.5 Completion

1.6 States of Matter

Quiz 1.6 Completion

Unit 1 Investigation: Density Completion

Unit 2: Trends of the Periodic Table

In this unit, students will discover how atomic structure and the periodic table are used to classify elements and develop chemical formulas. Students will explore the development of the current atomic model as well as the periodic table. Patterns of the periodic table that will be reinforced at this level include: valence electrons, families, state of matter, reactivity and relative mass.

At the end of this unit, students will be able to

- Identify elements based on atomic number.
- Calculate the number of electrons, protons, and neutrons to identify an element as an atom, ion or isotope.
- Explain the difference between atomic mass and mass number.
- Determine if an element is a metal, non-Metal or metalloid based on location in the periodic table.
- Identify reactivity and atomic size based on location in the periodic table.
- Explain how valence electrons impact the reactivity.

Unit 2 Study Guide

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2.1 Periodic Table

Quiz 2.1 Completion

2.2 Using Models to Represent Valence Electrons and Ions

Quiz 2.2 Completion

2.3 Trends of Metals

Quiz 2.3 Completion

2.4 Trends of Nonmetals

Quiz 2.4 Completion

2.5 Predicting Reactivity

Quiz 2.5 Completion

2.6 Solving PEN Problems

Quiz 2.6 Completion

Unit 2 Investigation: Relative Mass Completion

Unit 3: Bonding

In this unit, students will discover how the periodic table trends can help identify how to predict types of bonds that form, how to write the chemical formulas, and standard nomenclature for ionic, covalent and metallic bonds. The students will learn how Lewis Structures help to model chemical bonding. After identifying the types of bonds, students will learn about each type. How ionic bonding involves the transfer of electrons, covalent the sharing and metallic being a sea of electrons. Students will learn the common nomenclature and practice predicting and naming products of two elements.

At the end of this unit, students will be able to

- Classify bonds as ionic, covalent, or metallic.
- Identify types of covalent bonds (single, double and triple).
- Explain the advantages of polar covalent bonds.
- Compare the properties of ionic, covalent, or metallic compounds.
- Write formulas of ionic, covalent, or metallic compounds.
- Write names of ionic, covalent, or metallic compounds.

Unit 3 Study Guide

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3.1 Types of Bonding

Quiz 3.1 Completion

3.2 Ionic Bonds

Quiz 3.2 Completion

3.3 Covalent Bonds

Quiz 3.3 Completion

3.4 Metallic Bonds

Quiz 3.4 Completion

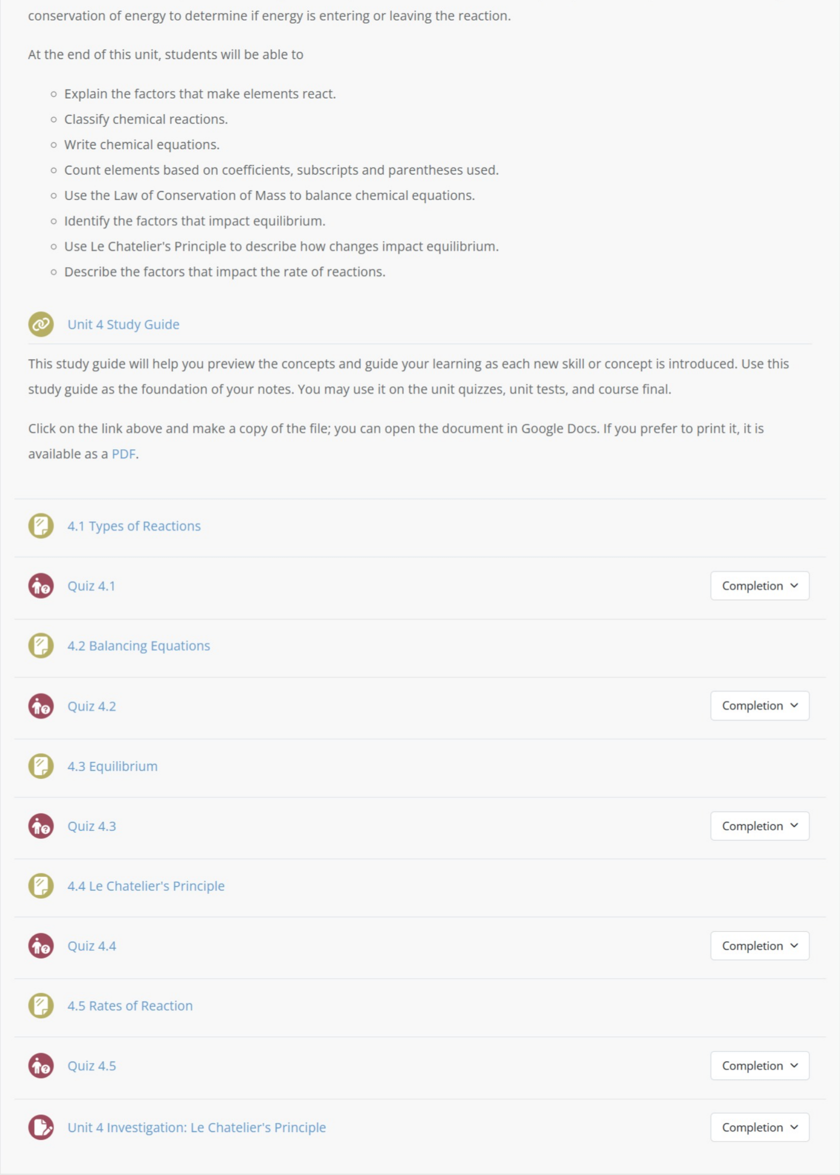
3.5 Nomenclature

Quiz 3.5 Completion

Unit 3 Investigation: Intermolecular Forces and Water Solubility Completion

Unit 4: Chemical Reactions

In this unit, students will explore the law of conservation of matter and energy as they relate to chemical reactions. They will begin by identifying chemical changes and types of reactions. Then using the conservation of matter, they will balance the products and reactants to determine equilibrium. Changes to the equilibrium due to Le Chatelier's principle will be explored as well as using the



conservation of energy to determine if energy is entering or leaving the reaction.

At the end of this unit, students will be able to

- Explain the factors that make elements react.
- Classify chemical reactions.
- Write chemical equations.
- Count elements based on coefficients, subscripts and parentheses used.
- Use the Law of Conservation of Mass to balance chemical equations.
- Identify the factors that impact equilibrium.
- Use Le Chatelier's Principle to describe how changes impact equilibrium.
- Describe the factors that impact the rate of reactions.

Unit 4 Study Guide

This study guide will help you preview the concepts and guide your learning as each new skill or concept is introduced. Use this study guide as the foundation of your notes. You may use it on the unit quizzes, unit tests, and course final.

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4.1 Types of Reactions

Quiz 4.1 Completion

4.2 Balancing Equations

Quiz 4.2 Completion

4.3 Equilibrium

Quiz 4.3 Completion

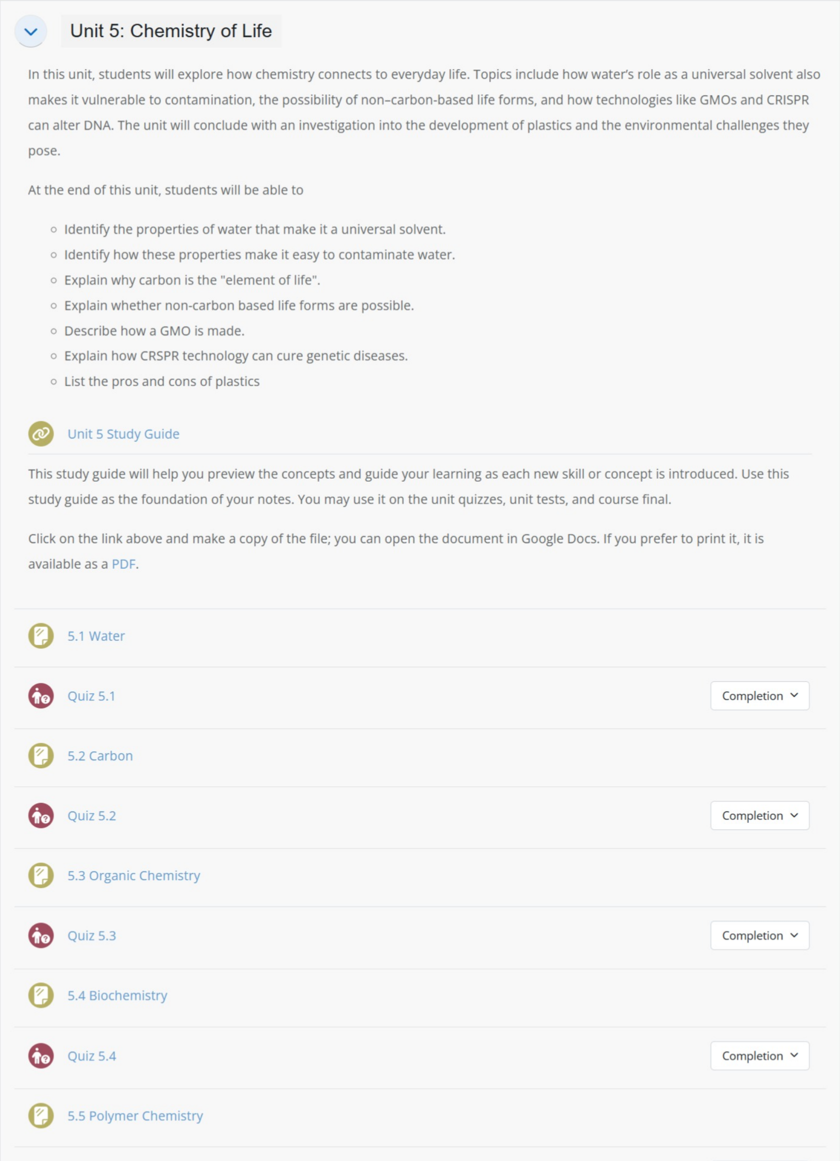
4.4 Le Chatelier's Principle

Quiz 4.4 Completion

4.5 Rates of Reaction

Quiz 4.5 Completion

Unit 4 Investigation: Le Chatelier's Principle Completion



Unit 5: Chemistry of Life

In this unit, students will explore how chemistry connects to everyday life. Topics include how water's role as a universal solvent also makes it vulnerable to contamination, the possibility of non–carbon-based life forms, and how technologies like GMOs and CRISPR can alter DNA. The unit will conclude with an investigation into the development of plastics and the environmental challenges they pose.

At the end of this unit, students will be able to

- Identify the properties of water that make it a universal solvent.
- Identify how these properties make it easy to contaminate water.
- Explain why carbon is the "element of life".
- Explain whether non-carbon based life forms are possible.
- Describe how a GMO is made.
- Explain how CRSPR technology can cure genetic diseases.
- List the pros and cons of plastics

Unit 5 Study Guide

This study guide will help you preview the concepts and guide your learning as each new skill or concept is introduced. Use this study guide as the foundation of your notes. You may use it on the unit quizzes, unit tests, and course final.

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5.1 Water

Quiz 5.1

5.2 Carbon

Quiz 5.2

5.3 Organic Chemistry

Quiz 5.3

5.4 Biochemistry

Quiz 5.4

5.5 Polymer Chemistry

Quiz 5.5 Completion

Unit 5 Investigation: Chemical Bonding Completion

Unit 6: Chemical Energy

In this unit, students will explore the fascinating world of nuclear science, focusing on several key topics that shape our understanding of the universe and technology. Students will learn about nuclear reactions, compare fission and fusion, explore the challenges associated with the disposal and management of radioactive materials, and introduce students to carbon dating, a method used in archaeology to determine the age of ancient artifacts.

At the end of this unit, students will be able to

- Classify chemical reactions as exothermic or endothermic.
- Classify nuclear reactions as fission or fusion.
- Solve problems related to half life.
- Determine the age of an artifact based on carbon dating.

Unit 6 Study Guide

This study guide will help you preview the concepts and guide your learning as each new skill or concept is introduced. Use this study guide as the foundation of your notes. You may use it on the unit quizzes, unit tests, and course final.

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6.1 Exothermic vs Endothermic

Quiz 6.1 Completion

6.2 Nuclear Energy

Quiz 6.2 Completion

6.3 Fusion vs Fission

Quiz 6.3 Completion

6.4 Radioactive Decay

Quiz 6.4 Completion

Unit 6 Investigation: Half Life

Completion

Final Exam

You will have access to the final after you have been enrolled in the course for at least 30 days and when all unit tests are completed, and your assignments are graded.

Warning: You have only ONE attempt at the final. Are you ready to take the final? We highly recommend you take the practice final first, and if you are weak in any area, review the relevant course material again. You have unlimited attempts at the practice final; it will help you to prepare.

Remember, if you want to improve your grade in this course, you need to do that BEFORE you take the final exam.

Good Luck!!

Not available unless: The activity **MANDATORY QUIZ** is marked complete

Course Completion & Requesting a Transcript

Warning - If you are waiting for a resubmitted assignment to be graded, do NOT generate any course completion record until the teacher has graded it.

Transcript - Send a transcript to your school to report the credits you earned. A transcript will list all the courses you have taken with us, including those still in progress.

Course Certificate - This link cannot be accessed until you have completed the final. Upon satisfying this requirement, the link will become active.

Feedback - Before you go, we would appreciate your opinion on the course; please take 1 minute to complete the feedback form. We hope you enjoyed this course!

Course Feedback

Thank you for taking this course! Let us know what you think about it.

Request a Transcript

Notify your school that you have completed your course. Send them a transcript by email or mail. A transcript will list all the courses you have completed and those in progress.

Certificate of Completion

Not available unless: The activity **Final Exam** is marked complete